

Amendments to the Claims:

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1. (Currently Amended) An electronic control unit for automobiles comprising:

a microcomputer for ~~operating a~~ generating a plurality of control signal signals for controlling a state of an automobile on the basis of ~~[[an]]~~ input ~~signal signals~~ from a plurality of sensors sensor; and

~~[[an]] plural~~ output driver ~~circuit circuits~~ for driving ~~an actuator a~~ plurality of actuators in response to ~~[[by]]~~ said control signal-obtained signals generated by said microcomputer, said output drive circuits being separated from said microcomputer, and electrically connected to said microcomputer through a serial communication line, a clock signal line and a synchronized signal line; wherein,

~~wherein~~ said output drive circuits include a first output drive circuit for an actuator controlled by a pulse width modulation signal, and a second

output drive circuit for an actuator controlled by a pulse signal that is
synchronized with engine rotation;

each of said output ~~drive driver circuit is composed of circuits~~
comprises a driver IC [[into]] which has integrated therein power transistors in
~~correspondence~~ corresponding to a plurality of channels, a serial communication
interface for executing serial communication with said microcomputer, and a
timer circuit for generating ~~at least one of a~~ said pulse width modulation signal
~~and a~~ or said pulse signal for said power transistors; ~~are integrated; and~~

said microcomputer is configured to supply a clock signal for timer
count generated by a microcomputer-side oscillator to said timer circuits of said
first and second output drive circuits via said clock signal line, transmit a first
control data signal for setting a frequency and duty factor of said pulse width
modulation signal to said first output drive circuit via said serial communication
line, transmit a second control data signal for setting output start timing and
output end timing or output start timing and pulse width of said pulse signal to
said second output drive circuit via said serial communication line, and supply
an engine rotation synchronized signal generated at said microcomputer-side,
based on a crank angle sensor signal and a cam angle sensor signal, via said
synchronized signal line;

~~wherein said timer circuit, on the basis of said control data signal~~
~~received from said microcomputer by said serial communication interface, of said~~
~~first output drive circuit~~ generates at least one of said pulse width modulation
signal and said pulse signal, based on said first control data signal received from
said microcomputer by said serial communication interface; and

said timer circuit of said second output drive circuit generates said
pulse signal on the basis of the second control data signal received from said
microcomputer by said serial communication interface and said engine rotation
synchronized signal supplied from said microcomputer.

Claim 2. (Currently Amended) [[An]] The electronic control unit for
automobiles according to Claim 1, wherein;

said microcomputer supplies [[a]] said clock signal for timer count to
said timer circuit built in said driver IC; and

said timer circuit, ~~on the basis of a control data signal for setting~~
~~the frequency and duty of said pulse width modulation signal transmitted from~~
~~said microcomputer,~~ generates [[a]] said pulse width modulation signal, based on
said first control data signal.

Claim 3. (Cancelled)

Claim 4. (Currently Amended) ~~[[An]]~~ The electronic control unit for automobiles according to Claim ~~[[3,]]~~ 1, wherein said engine rotation synchronized signal is a pulse signal indicating that the piston of each cylinder of said engine is positioned at a specific reference point and the pulse width of said signal depends on the cylinder number.

Claim 5. (Currently amended) ~~[[An]]~~ The electronic control unit for automobiles according to Claim 1, wherein:~~comprising:~~

~~a microcomputer for operating a control signal for controlling a state of an automobile on the basis of an input signal from a sensor; and~~

~~an output driver circuit for driving an actuator by said control signal obtained by said microcomputer; wherein~~

~~said output driver circuit is composed of power transistors in correspondence to a plurality of channels, a serial communication interface for executing serial communication with said microcomputer, and a driver IC which is a semiconductor circuit having integrated timer circuits for generating a pulse width modulation signal and a pulse signal; and~~

~~said timer circuit, on the basis of said control data signal received from said microcomputer by said serial communication interface, generates said pulse width modulation signal and said pulse signal; and~~

wherein said microcomputer supplies [[a]] said clock signal for timer count to said timer circuit built in said driver IC; and

~~said timer circuit, on the basis of a~~ based on said signals of said crank angle sensor signal and [[a]] cam angle sensor signal which are input to said timer circuit, said timer circuit discriminates the position of each cylinder of said engine, and ~~on the basis of a control data signal for setting the frequency and duty of said pulse width modulation signal transmitted from said microcomputer,~~ generates a pulse width modulation signal based on said first control data signal transmitted from said microcomputer.

Claim 6. (Currently Amended) [[An]] The electronic control unit for automobiles according to Claim 5, wherein said timer circuit built in said driver IC has a register for storing a specification for pulse patterns of said crank angle sensor signal and said cam angle sensor signal.

Claim 7. (Currently Amended) [[An]] The electronic control unit for automobiles according to Claim 1, wherein said driver IC additionally has an integrated A-D converter, converts a sensor signal to a digital signal by said A-D

converter, and transmits a conversion result to said microcomputer via said serial communication.

Claim 8. (Currently Amended) [[An]] electronic control unit for automobiles according to Claim 1, further comprising, in addition to said driver IC, an A-D conversion IC composed of an A-D converter and a serial communication interface, wherein an A-D conversion result by said A-D converter is transmitted to said microcomputer via said serial communication.

Claim 9. (Cancelled)